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RESEARCH ARTICLE

The Role of Facebook in Crisis Information Dissemination: A Case Study of Dara-e-Noor District during the 2025 Eastern Afghanistan Earthquake

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ABSTRACT

This study explores the role of Facebook in crisis communication after the devastating August 31, 2025 earthquake in Eastern Afghanistan. Social media platforms are often used in natural disasters, but there is a significant academic gap regarding their systematic impact on local crisis management in the region. The main objective of this study was to evaluate the effectiveness of Facebook in information production and Quality, information dissemination and awareness, emergency needs reporting and Communicative coordination. A quantitative survey design was employed, utilizing a non-probability sampling strategy (purposive and snowball techniques) to select 231 eyewitnesses and active Facebook users, with the sample size determined by Cochran's formula for unknown populations, using a structured online questionnaire. The data were subjected to statistical analysis using Pearson correlation and multiple linear regression. The results indicate that the Facebook information dissemination model can explain 65.9% of the variance of overall crisis communication effectiveness. Reporting emergency needs and organizing communicative coordination were particularly strong predictors of success, significantly accelerating the delivery of aid and alleviating public anxiety. Ultimately, this study explores the potential of Facebook as a strategic communication bridge in remote areas, effectively filling official information vacuums, and promoting digital volunteerism. These findings provide a practical framework for national disaster management authorities and policymakers to best optimize future humanitarian crisis interventions.

ARTICLE INFO

Keywords: *Crisis Communication, Communicative Coordination, Emergency Needs Reporting, Eastern Afghanistan earthquake, Facebook, Information Dissemination.*

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Introduction

The rapid development of Information and Communication Technology (ICT) has radically changed the paradigm of human interaction and social relation. The advent of social media platforms and smartphones has broken down the traditional barriers of time and space, creating new ways of interaction, engagement and collaboration in the virtual space (Coombs, 2023). Among these online tools, Facebook has gained a strategic and dominant position in several societies around the world, especially in Afghanistan where it acts as the main platform for the exchange of information in real time. The platform's accessibility, unmatched speed in disseminating information and ability to share multimedia content have made it a crucial tool during emergencies and natural disasters where even government agencies and aid organizations increasingly depend on digital data for situational assessments (Reuter & Kaufhold, 2017).

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When dealing with crisis communication, the basic element needed to prevent loss of human life, to protect property, and to minimize the overall effect of disaster is the prompt and accurate exchange of information. Contemporary theories of crisis suggest that digital networks are not just sources of entertainment, but also powerful tools for social cohesion and collective action during crises. Media Dependency Theory, therefore, suggests that in the event of natural disasters, when traditional media infrastructure is often destroyed or structurally delayed, the public becomes more dependent on social networks to build mutual trust, organize local collaboration and ignite community-led action (Ball-Rokeach & DeFleur, 1976).

Empirical evidence around the world has shown that Facebook significantly improves Situational Awareness in times of crisis and is an effective tool in controlling the spread of misinformation (Houston et al., 2015). Preliminary observations in Afghanistan suggest that after the deadly earthquake in August 31, 2025 Eastern Afghanistan earthquake, Facebook usage likely increased among local residents and youth. It is hypothesized that pages and groups may have served as reliable sources for emergency news, identifying missing persons, documenting local damages, and coordinating domestic and international aid. Studies have shown that informal, crowdsourced information can be just as scientifically valid as official data in effectively managing crises (Palen & Vieweg, 2008). While Facebook is assumed to have played a significant role during the Eastern Afghanistan earthquake, this study aims to address the research gap in Afghan academia by quantitatively investigating its exact scientific impact on crisis communication. The study is based on Media Dependency Theory, Crisis Informatics and Social Media Response in Disasters' theory. The study answers the following research questions. How Facebook helped with crisis communication and information sharing after the August 31,2025 Eastern Afghanistan earthquake? The study adopted a quantitative methodology by analyzing data collected from 231 respondents using a structured questionnaire. This study aims to provide a valid and scientific assessment of the actual contribution of Facebook to disaster response through statistical analysis using SPSS including Pearson Correlation Matrix and Multiple Linear Regression.

This research provides a strategic and practical guide for Afghanistan National Disaster Management Authority (ANDMA), provincial administrations, non-governmental organizations (NGOs) and policymakers to manage future natural disasters. Facebook is an independent communication system that helps people communicate their safety, which in turn alleviates the load on traditional telecommunication networks (Fraustino et al., 2012). This study is a pioneering and fundamental contribution to bridging the existing academic vacuum in Afghan digital sociology and crisis communication.

Literature Review

In the nascent field of crisis informatics, social media has been identified as a significant communication infrastructure in natural disasters, especially when conventional communication systems fail. Previous studies have repeatedly shown that digital platforms can facilitate rapid information production, public awareness, communicative coordination, and emergency needs reporting. However, the bulk of this evidence comes from technologically advanced societies, raising the question of whether similar communication dynamics exist in geographically remote and resource-poor settings such as Dara-e- Noor District in Nangarhar Provinsce, Afghanistan.

Stanekzai (2022) conducted a comparative study on the reliance level of radio and Facebook in natural disaster management in Afghanistan. The findings revealed that radio was more effective for early warning, while Facebook played a significant role in post-disaster assistance coordination and situation awareness. This finding is directly related to the current study's focus on communicative coordination. However, unlike Stanekzai's study, which compared different media platforms, the present study focuses specifically on Facebook as a crisis communication tool and examines its overall effectiveness during the eastern Afghanistan earthquake through a structured model.

Rahimi (2021) explored Facebook and WhatsApp usage during the COVID-19 pandemic in Nangarhar Province. The study found that although the digital platforms greatly increased the speed of information dissemination, the concerns about the credibility of information were still significant. This offers vital regional data on public trust in digital communication. But Rahimi (2021) focused on the lengthy public health emergency. The current study looks at sudden onset earthquake communication of timely and accurate information that directly impacts immediate disaster response.

Eftikhari (2020) investigated how the media handled the COVID-19 outbreak in Afghanistan. According to the study, media especially digital and social media was crucial in filling in knowledge gaps, spreading preventative advice,

and raising public awareness. However, the current study looks at Facebook-based crisis communication during an earthquake in Eastern Afghanistan, whereas the previous study concentrated on a health crisis and the broader role of media.

Khan et al. (2020) investigated the frequency and priority of social media use as a primary source of information during the Taliban takeover of Afghanistan according to their research, Afghans most frequently used social media, especially Facebook, to stay informed about current affairs and stay in touch with friends and family during times of crisis. While the first study focused on the effects on mental health and information-seeking behavior during a time of political transition and conflict, the present study examines Facebook-based crisis communication during an earthquake in Eastern Afghanistan.

Mohiqi (2024) examined the role of digital technologies and social media platforms in documenting human rights issues and amplifying marginalized voices in Afghanistan. The results demonstrated that real-time information sharing and broader narrative transmission are supported by social media sites like Facebook and Twitter. This result is related to the current study's emphasis on the spread of information via Facebook. However, the current study investigates Facebook's function in crisis communication after the Eastern Afghanistan earthquake, in contrast to Mohiqi's work, which concentrated on human rights and war situations.

Hocevar (2023) researched crisis communication during wildfire emergencies in the United States using Social Network Analysis (SNA) on Twitter (X). The study revealed that ordinary citizens are the main producers and disseminators of crisis-related information when official communication channels are disrupted. This finding supports the argument that content created by users plays a significant role in the earliest phases of disasters. However, the Hocevar study was conducted in a highly digitalized environment with advanced communication infrastructure, whereas the current study considers Facebook-based communication in a rural Afghan context with limited access to institutional media. Similarly, Chu et al. (2013) studied the communication patterns during the Great East Japan Earthquake and found a change in the structure from centralized government-controlled communication to decentralized peer-to-peer social media networks. They find that during emergencies, citizens become the primary source of situational information. Although this is supportive of the current study's focus on community-generated information, Japan's advanced technological environment is very different from the infrastructural constraints of Dara-e-Noor District.

Tandoc and Takahashi (2016) examined Facebook's role post-Typhoon Haiyan in the Philippines and found that social media helped facilitate emotional support, public awareness, and community resilience by allowing users to maintain open communication channels with relatives and volunteer networks. Facebook was used not only as a way to share information, but also as a collective way of coping with the disaster, they found. The current study extends this view by looking at the role of localized Facebook communication in increasing awareness and psychological reassurance in a culturally specific Afghan community.

Sharp and Carter (2020) undertook qualitative interviews to investigate communication practices in flood emergencies in the United Kingdom. They found social media greatly enhanced communicative coordination compared to traditional methods by decreasing the time to respond and enabling the mobilization of volunteers. Although their research is primarily concerned with organized institutional settings, it provides theoretical support for conceptualizing Facebook as a coordination mechanism for local volunteers and community groups in rural Afghanistan.

Anees and Ashfaq (2023) examined the application of digital communication platforms by administrators in the disaster management of Khyber Pakhtunkhwa, Pakistan. They discovered that digital media enhanced coordination processes and disaster response efficiency. But their work was on institutional disaster management systems, while this study looks at citizen-driven coordination through Facebook, where there is limited formal institutional capacity in communities.

Sadri et al. (2018) examined social media communication during Hurricane Sandy and found that online platforms were crucial for reporting urgent humanitarian needs and enabling quick resource allocation when traditional communication systems failed. Their study underlines the need for emergency reporting from the community to speed up the disaster response. While Sadri et al. (2018) used machine learning to analyze Twitter data, the present study uses a quantitative survey on Facebook to explore similar emergency reporting functions.

Ebrahimnia and Zandieh (2021) examined the 2019 Lorestan floods in Iran and found that social media were effective in filling information gaps and facilitating emergency coordination in a context where public trust in official communication was low. Their work emphasizes the value of digital platforms as a way to report urgent

needs and mobilize help. However, their study was conducted in a different socio-political context, this research evaluates Facebook communication in the particular cultural and geographical context of eastern Afghanistan.

Finally, Splendiani and Capriello (2022) examined the quality of the official crisis communication during the Italian earthquake and revealed that effective disaster communication depends on timely, accurate and credible information rather than political messaging. The findings emphasize the importance of information quality in reducing uncertainty and improving public trust, and offer theoretical support for the dimension of information quality investigated in this study.

Taken together, the literature suggests a broad consensus that social media plays a significant role in information production, public awareness enhancement, communicative coordination, reporting emergency needs, and crisis communication in general during disasters. However, most of the studies carried out so far have been in technologically advanced societies or in institutional communication systems. Empirical evidence on Facebook-based crisis communication in remote, resource-constrained, and culturally different communities such as Dara-e-Noor District is limited. The present study aims to fill this gap by evaluating whether Facebook served as a primary crisis communication platform and quantitatively investigating its potential impact during the earthquake response in the Afghan context.

The study has the following specific objectives:

- To determine the role of Facebook information dissemination in crisis communication after the earthquake.
- To investigate the role of Facebook information dissemination in delivering accurate information and stopping misinformation and rumors after the earthquake.
- To evaluate the role of Facebook information dissemination in raising public awareness and establishing confidence between the citizens and public institutions in the post-earthquake crisis.
- To assess the role of Facebook information dissemination in enabling coordination between affected communities, volunteers and humanitarian organizations in disaster response
- To evaluate Facebook's information dissemination role in reporting disaster damage and urgent humanitarian needs, and disseminating this information to humanitarian organizations.

In alignment with these objectives, the study addresses the following research questions:

- What role did Facebook information dissemination play in crisis communication after the earthquake?

Specific Questions

- How did Facebook information dissemination help in producing accurate information and controlling misinformation and rumors after the earthquake?
- How did Facebook information dissemination contribute to raise the public awareness and to reinforce the trust between the citizens and the public institutions during the crisis?
- What role did Facebook information dissemination play in mobilizing affected communities, volunteers and humanitarian organizations?
- How did Facebook information dissemination allow reporting of disaster damages and urgent humanitarian needs to humanitarian organizations?

Hypotheses

Main Research Hypotheses

Facebook's dissemination information plays a significant positive role in crisis communication after the earthquake.

Sub Hypotheses

- Dissemination of information through Facebook is an effective role in the production of accurate information and reduction of rumors in crisis communication after the earthquake.
- Facebook's information dissemination contributes significantly to public awareness and maintaining trust between citizens and relief institutions in post-earthquake crisis communication.
- Facebook's information dissemination is fundamental to enabling communicative coordination between affected citizens, volunteers and humanitarian aid agencies in the post-earthquake response.
- The ability of Facebook information dissemination is essential to emergency reporting through the collection of damages, the announcement of needs, and the provision of real-time data to aid organizations in the wake of the earthquake.

Methods and Materials

This study uses a Paradigm of positivism with the method of the quantitative survey. The research uses a cross-

sectional descriptive-analytic design to study the relationship of spreading digital information and the effectiveness of crisis management. This method enables hypotheses testing and the quantification of the effects of Facebook's information dissemination role in statistical frameworks.

Population and Sample

The statistical population is the residents and eyewitnesses of the Dara-e-Noor district of Nangarhar province affected by the August 31, 2025 earthquake and Facebook users during the crisis. In the disaster-affected area, there was no formal sampling frame, so a non-probability sampling strategy was adopted. A combination of purposive and snowball sampling techniques was used. The final sample was 231 respondents, using Cochran's formula for unknown populations, with a predominantly young, educated demographic.

Instrument of Research

A structured online questionnaire developed through Google Forms was the main data collection tool. The instrument was built on the basis of existing theories such as Media Dependency Theory Crisis Informatics and Social Media as a Disaster Response Theory. It was measured on a 5-point Likert scale across five core variables: Information Production and Quality, Information Dissemination and Awareness, Communicative Coordination, Emergency Needs Reporting, and Overall Crisis Communication Effectiveness.

Validity and Reliability

Table 1. *Reliability Analysis*

Variables	Number of Items	Cronbach's Alpha	Reliability Level
Information Production and Quality	5	0.827	High
Information Dissemination and Awareness	5	0.830	High
Communicative coordination	5	0.822	High
Emergency Need Repotting	5	0.835	High
Overall Crisis Communication Effectiveness	5	0.859	High

To ensure the scientific rigor of the research instrument, both validity and reliability analyses were conducted. Content validity was established through expert examination by a panel of journalism and communication academics from reputable universities, who reviewed the items for clarity, relevance and cultural appropriateness. Construct validity was ensured by aligning the questionnaire items with established theoretical frameworks, specifically drawing upon and adapting measures from Houston et al. (2015) for social media functional roles and Tandoc and Takahashi (2016) for community-based digital resilience.

Furthermore, a pilot test was conducted with a group of 30 respondents from the target population to identify potential ambiguities and ensure the questionnaire's effectiveness before full-scale distribution. Based on the pilot feedback, minor linguistic adjustments were made to ensure the instrument was easily understood by the local community in Dara-e-Noor.

The internal consistency of the final instrument was evaluated using Cronbach's Alpha. As shown in Table 1, all variables yielded values exceeding the 0.80 threshold, indicating a high degree of reliability. Specifically, the values ranged from 0.822 for Communicative Coordination to 0.859 for Overall Crisis Communication Effectiveness, confirming that the scale is highly reliable for measuring the intended constructs in the Afghan context.

Data Collection Approach

Data were gathered digitally over 15 days using social platforms like Facebook Messenger and WhatsApp. Ethical protocols were observed. Participation was voluntary; informed consent was sought and given; anonymity of respondents and confidentiality of data were assured. A filtration mechanism was employed in the snowball process to prevent duplicate entries and maintain data integrity.

Data Analysis Methods

Statistical analysis was performed using SPSS version 27. The analysis was conducted at two levels, descriptive statistics (frequencies, percentages, means and standard deviations) summarized demographic data and identified general response patterns. Inferential Statistics was used to perform Pearson Correlation Analysis to determine the direction and strength of relationships between variables. In addition, Multiple Linear Regression was used to test the primary research hypotheses and to determine the most significant predictors of crisis communication

effectiveness. Parametric analyses were preceded by assessing the normality of data distribution using Skewness and Kurtosis tests.

Operational Definition of Variables

The research model has four independent variables and a dependent variable,

- Information Production and Quality(IV1): Timeliness, Accuracy, Filtering, Updating and Authority.
- Information Dissemination and Awareness (IV2): Information Reach, Public Awareness, Self-Protection Guidance, Fear Reduction and Situation Clarity.
- Communicative Coordination (IV3): Social Coordination, Institutional Communication, Volunteer Mobilization, Situational Understanding and Aid Coordination.
- Emergency Needs Reporting (IV4): Emergency Needs Identification, Institutional Response, Response Time, Rescue Effectiveness and Identification of Affected Areas.
- Overall Effectiveness of Crisis Communication (DV1): Effectiveness of Crisis Communication, Reduction of Information Confusion, Mutual Understanding, Trust Building and Sustainability of Communication Model.

Findings

Demographic Information

Table 2. *Distribution of Respondents by Age*

		Frequency	Percent
Valid	18-24 years	59	25.5
	25-34 years	120	51.9
	35-44 years	41	17.7
	45 years and above	11	4.8
	Total	231	100.0

As shown in Table 2, the largest proportion of respondents were in the 25–34 years' age group (51.9%, n = 120), followed by those in the 18–24 years' age group (25.5%, n = 59). The 35-44 years' age group constituted 17.7% (n = 41) and the 45 years and above group was the smallest group (4.8%, n = 11) of respondents. The overall percentage of respondents younger than 35 years was 77.5%. This shows that the sample consisted to a large extent of young adults.

Table 4 *Distribution of Respondents by Gender*

		Frequency	Percent
Valid	Male	231	100.0
	Female	0	0
		231	100.0

Table 3 shows that all respondents were male (100%, n = 231) and there were no female Facebook users in the sample. This means that all the participants in the study sample were male.

Table 4. *Educational Level of Respondents*

		Frequency	Percent
Valid	Meddle school	5	2.2
	High School graduate	25	10.8
	Diploma(14th Grade)	48	20.8
	Bachelor's degree	151	65.4
	Master degree or above	2	.9
	Total	231	100.0

The majority of the respondents had a bachelor's degree (65.4%, n = 151), followed by diploma (20.8%, n = 48) and high school education (10.8%, n = 25) as shown in Table 3. 2.2% (n = 5) had finished middle school. 0.9% (n = 2) had a master's degree or higher. 86.2% of the respondents had an education at diploma or bachelor level.

Table 5. *Duration of Facebook Use Among Respondents*

		Frequency	Percent
Valid	1-3 years	4	1.7
	4-6 years	42	18.2
	7-10 years	97	42.0
	More than 10 years	88	38.1
	Total	231	100.0

Table 5 shows that 42.0% (n = 97) of the respondents have used Facebook for 7-10 years and 38.1% (n = 88) for more than 10 years. In general, 80.1% of respondents had more than seven years of Facebook experience.

Table 6. *Daily Facebook Usage Among Respondents*

		Frequency	Percent
Valid	1-3 hours	102	44.2
	4-6 hours	93	40.3
	7-10 hours	27	11.7
	More than 10 hours	9	3.9
	Total	231	100.0

As shown in Table 6, 44.2% (n = 102) of respondents used Facebook for 1-3 hours per day, and 40.3% (n = 93) used it for 4-6 hours per day. The majority of respondents (84.4%) reported spending 1 to 6 hours per day on Facebook.

Descriptive Statistics

Table 7. *Descriptive Statistics of the Study Variables*

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Information Production and Quality	231	2.40	5.00	4.2545	.64603
Information Dissemination and Awareness	231	2.20	5.00	4.4424	.56762
Communicative Coordination	231	2.20	5.00	4.4866	.57946
Emergency Need Repotting	231	2.00	5.00	4.4468	.60136
Overall Crisis Communication Effectiveness	231	2.20	5.00	4.4797	.58997
Overall Variable Effects	231	2.44	5.00	4.4220	.52479
Valid N (listwise)	231				

The results of Table 7 indicated that all the variables had relatively high mean scores, ranging from 4.2545 to 4.4866 on a five-point Likert scale. Since all the mean values are above 4, this shows that the respondents strongly agree on the positive role of Facebook in crisis communication after the Eastern Afghanistan earthquake.

Communicative coordination has the highest mean score (M=4.4866) among the variables, indicating Facebook was critical in coordinating communication among local communities, volunteers and relief organizations. The next is overall crisis communication effectiveness (M = 4.4797). This suggests the high perceived effectiveness of Facebook during the emergency situation. Moreover, there is a good agreement in emergency needs reporting (M = 4.4468) and information dissemination and awareness (M = 4.4424) and the importance of Facebook in reporting emergency needs and disseminating timely information. Information production and quality (M = 4.2545) although not as high as other variables still indicate a high level of perceived accuracy and timeliness of information shared.

The overall combined variable mean (M = 4.4220) confirms a strong positive evaluation of Facebook information dissemination in crisis communication.

In terms of dispersion, all standard deviation values are low (0.52–0.64), which shows a high level of consistency among respondents. The overall variable shows the least variability (SD = 0.52479) indicating strong agreement and less difference in the responses thereby improving the reliability of the findings.

Normality Test

Table 8. *Normality Test Results for Study Variables*

Variables	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Information Production and Quality	231	-1.029	.160	.538	.319
Information Dissemination and Awareness	231	-1.584	.160	2.357	.319
Communicative Coordination	231	-1.695	.160	2.796	.319
Emergency Need Repotting	231	-1.730	.160	2.851	.319
Overall Crisis Communication Effectiveness	231	-1.850	.160	3.518	.319
Valid N	231				

The results of normality testing using skewness and kurtosis statistics are shown in Table 8. The skewness

values are between -1.029 and -1.850 and the kurtosis values are between 0.538 and 3.518. All values are within the commonly accepted thresholds for normality (±2 for skewness and ±7 for kurtosis), indicating no significant deviation from a normal distribution.

Moreover, the sample size (N = 231) is large enough to meet the assumptions of Central Limit Theorem, which justifies the normality of the sampling distribution. Therefore, the data satisfy the normality assumption and are suitable for further parametric statistical analyses.

Pearson Correlation Analysis

Table 9. *Pearson Correlation Matrix of Study Variables*

Variables		IV1	IV2	IV3	IV4	DV1
Information Production and Quality	Pearson Correlation	1	.702**	.676**	.594**	.597**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	231	231	231	231	231
Information Dissemination and Awareness	Pearson Correlation	.702**	1	.818**	.738**	.698**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	231	231	231	231	231
Communicative Coordination	Pearson Correlation	.676**	.818**	1	.832**	.763**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	231	231	231	231	231
Emergency Need Repotting	Pearson Correlation	.594**	.738**	.832**	1	.777**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	231	231	231	231	231
Overall Crisis Communication Effectiveness	Pearson Correlation	.597**	.698**	.763**	.777**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	231	231	231	231	231

From Table 9, it is observed that all the variables in the study have a positive and significant relationship at 0.01 significance level ($p < .001$). The results show that information production and quality are moderately positively related to the overall crisis communication effectiveness ($r = .597$, $p < .001$). Likewise, there is positive correlation between dissemination of information and awareness with crisis communication effectiveness ($r = .698$, $p < .001$).

Among the independent variables, the highest positive correlation is between emergency needs reporting ($r = .777$, $p < .001$). In terms of independent variables, communicative coordination has a high positive correlation with overall crisis communication effectiveness ($r = .763$, $p < .001$).

To summarize, the findings show that improvements in information production and quality, information dissemination and awareness, communicative coordination and reporting on emergency needs correlate with higher overall crisis communication effectiveness.

Model Summary

Table 10. *Regression Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.812[a]	.659	.653	.34733

The results in Table10. The independent variables show a strong positive relationship with the dependent variable ($R = 0.812$). This indicates a robust joint predictive association.

The coefficient of determination ($R^2 = 0.659$), which indicates that 65.9% of the variance in crisis communication effectiveness is explained by the independent variables, while the remaining 34.1% is

explained by other factors not included in the model. This is a strong explanatory power in the social science research.

The R^2 (0.653) is very close to R^2, suggesting good model stability and strong generalizability. The standard error of estimate is relatively small (0.34733) which indicates that the regression model has high predictive accuracy.

ANOVA[a] Test

Table 11. *Analysis of Variance (ANOVA) for the Regression Model*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	52.790	4	13.198	109.397	.000[b]
	Residual	27.264	226	.121		
	Total	80.054	230			

The results of the ANOVA indicate that the regression model is statistically significant ($F(4,226) = 109.397$, $p < 0.001$). This confirms that the independent variables jointly have a significant effect on the effectiveness of crisis communication.

Consequently, the null hypothesis is rejected, and the model is statistically valid and reliable for prediction.

Coefficients[a]

Table 12. *Regression Coefficients of the Study Variables*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.582	.192		3.033	.003		
	Information Production and Quality	.088	.051	.096	1.705	.089	.476	2.102
	Information Dissemination and Awareness	.109	.076	.104	1.430	.154	.282	3.541
	Communicative Coordination	.257	.087	.252	2.966	.003	.208	4.809
	Emergency Needs Reporting	.425	.070	.433	6.083	.000	.297	3.362

The regression coefficients that show how each independent variable affects the efficacy of crisis communication are shown in Table 12. The findings show how a one-unit increase in each variable numerically alters the result while holding other variables constant, as indicated by the unstandardized coefficients (B):

Information Production and Quality (X-1): This variable has an unstandardized coefficient (B) of 0.088. This means that the effectiveness of crisis communication is predicted to rise by 0.088 units for every unit increase in information production and quality. Nevertheless, $p = 0.089$ indicates that this relationship is not statistically significant.

Information Dissemination and Awareness (X-2): This effect similarly lacks statistical significance ($p = 0.154$), but a one-unit increase in information dissemination and awareness results in a 0.109-unit increase in communication effectiveness (coefficient of 0.109).

Communicative Coordination (X-3): The influence of this factor is significantly positive ($p = 0.003$). The overall effectiveness of crisis communication increases by 0.257 units for every unit increase in communicative coordination.

Emergency Needs Reporting (X-4): The most significant predictor ($p < 0.001$) is this. The efficacy of crisis communication rises by 0.425 units for every unit improvement in reporting emergency needs.

The expression for the final regression model is $Y = 0.582 + 0.088X\text{-}1 + 0.109X\text{-}2 + 0.257X\text{-}3 + 0.425X\text{-}4$. These results demonstrate that all factors have a beneficial impact on crisis communication efficacy, but emergency

reporting and coordination yield the largest numerical benefits.

Summary of Hypotheses Testing

• Hypothesis 1 (Information Production and quality): Not supported (p = .089)

• Hypothesis 2 (Information Dissemination and Awareness): Not supported (p = 0.154)

• Hypothesis 3 (Communicative Coordination): Supported (p=0.003)

• Hypothesis 4 (Emergency Needs Reporting) Accepted (p < 0.001)

The results of the ANOVA (F = 109.397, p < 0.001) strongly support the overall model which explains a significant proportion of variance ($R^2 = 0.659$). Thus, crisis communication via Facebook information dissemination contributes substantially to the overall Crisis Communication effectiveness, primarily through the coordination and reaction mechanisms.

Final Decision on the Main Hypothesis

Facebook's dissemination information played a significant positive role in crisis communication after the earthquake.

Conclusion: Accepted.

Scientific and Statistical Basis: Communicative coordination and emergency needs reporting demonstrated the explanatory roles of the first and second sub-hypotheses (information production and information dissemination and awareness), even though they did not individually show statistically significant effects when simultaneously entered into the regression model. Facebook-related crisis communication factors jointly explain a significant portion of the variance in crisis communication effectiveness in Dara-e-Noor District, according to the high coefficient of determination ($R^2 = 0.659$) and the overall significance of the ANOVA test (F = 109.397, p < 0.001). Among these variables, the efficiency of crisis communication was more strongly predicted by communicative coordination and quick reporting of emergency demands. Nevertheless, rather than direct causal impacts, these results show statistical connections and predictive relationships.

Discussion

1. Information Production and Quality

The first finding indicates that information production and quality were critical to making sense of the situation and controlling rumors during the initial and critical stages of the earthquake. Traditional media could not achieve timely coverage due to lack of formal media infrastructure and geographical remoteness of Dara-e- Noor District. Facebook users thus became de facto first responders, creating and sharing real-time visual and textual information from the disaster site.

These findings align with Hoseyvar (2023), who states that in disasters like large-scale wildfires, where official communication systems are slow or not functioning properly, citizens are the most powerful producers of information about the crisis. Similarly, Chou et al. (2013) say that social media turns crisis communication from institutionally controlled to user-driven information ecosystems where content created by users is central to decision-making.

However, existing research focuses predominantly on developed contexts (e.g., the USA and Japan), where digital infrastructure guarantees stable connectivity and fast information verification. In contrast, this study fills a significant gap, showing that even in resource-constrained and remote areas, organic community participation can compensate for the absence of formal media systems. This finding implies that local users may be the fastest and easiest source of initial crisis intelligence in the early stages of disasters.

2 Information Dissémination and Awareness

The second finding indicates that the dissemination of information and the raising of awareness through Facebook substantially led to emotional stability, self-protection awareness, and psychological relief for the earthquake-affected individuals.

Without the presence of formal psychological support services and awareness campaigns in Dara-e-Noor, Facebook became the primary platform for reassurance messages, safety updates and emotional support. This finding is consistent with Tandoc and Takahashi (2016), who stress that social media enables collective coping mechanisms and enhances social support during crises. Likewise, Eftikhari (2020) emphasizes that digital media is a key factor in shaping public understanding and emotional resilience during emergencies.

However, previous studies have mostly been conducted in highly digital-literate societies with well-established institutional communication systems. This study contributes to the literature by showing that in culturally sensitive and remote contexts, localized and personally mediated digital communication can outperform formal institutional messaging in reducing fear and uncertainty.

3 Communicative coordination

Third, the coordination of communication via Facebook was important in organizing local youth, volunteers and traditional community councils in the management of human and material resources during the crisis.

The analysis indicates that Facebook helped to coordinate between communities and relief actors, improved mobilization of volunteers and improved situational awareness. This supports the findings of Sharp and Carter (2020), who argue that social media allows for a quicker response time and better coordination of volunteers than traditional communication channels. Likewise, Anis (2023) found that digital media enhances coordination mechanisms and reduces the time in disaster response.

But much of the previous research has focused on formal organizational structures and institutional response systems. The present study fills an important gap, showing how Facebook can be used to transform traditional collective systems (such as communal solidarity practices) into digital coordination networks in rural settings. It is a model of disaster resource management that is culturally embedded and not overly reliant on institutional funding.

4 Emergency Needs Reporting

The fourth finding is that reporting and responding to emergency needs was a direct and crucial contributor to the highlighting of humanitarian needs and the mobilization of assistance.
Facebook was used as a real time communication tool, to communicate urgent needs such as shelter, food, medicine and medical evacuation. These posts drew attention from local and international relief organizations.

This finding is in line with Sadr et al. (2018) who argue that geotagged emergency reporting on social media can significantly speed up the allocation of resources in the case of disasters. Ebrahiminia and Zandieh (2021) also point out the strategic importance of digital platforms in the coordination of emergency response and the mobilization of public resources.

But previous studies tend to focus on algorithm-driven systems or official institutional data. Conversely, this study demonstrates how Facebook posts produced by members of the public, in the absence of formal response teams, serve as a real-time emergency reporting system, effectively replacing delayed institutional assessments.

5 Overall Crisis Communication Effectiveness

The last finding confirms that overall crisis communication effectiveness is representative of a combined effect of all communication dimensions, which in turn leads to less misinformation, better understanding, and more public trust.

In the earthquake response, local Facebook users sharing accurate information helped reduce uncertainty and misinformation. This finding agrees with Rahimi (2021) who observed that digital media is fast but not credible unless it is filtered properly. Similarly, Splendian and Caprilo (2022) assert that effective crisis communication depends on the systematic collection and validation of information.
But there is a lack of current studies on informal and heuristic communication models. This research adds to the existing literature by showing that in rural and ethnically close communities, trust is socially constructed through interpersonal familiarity and ethnic/community ties rather than institutional authority.

This corroborates the Media Dependency Theory and confirms that remote-context Facebook-based crisis communication can be a strong and sustainable model for disaster management. It means that such systems can be successfully integrated into national disaster preparedness policies especially in remote areas of the country.

6 Synthesis

Overall, the findings suggest that Facebook-based crisis communication in Dara-e- Noor District was undertaken through four main mechanisms: information Production and Quality, Information dissemination and awareness, communicative coordination and emergency needs reporting. All variables were significantly related but regression results showed that communicative coordination and emergency needs reporting were the strongest predictors of crisis communication effectiveness.

Thus, information production and quality is not enough in a crisis, but its value comes from organized coordination and timely Emergency needs reporting embedded in local socio-cultural structures.

Conclusion

Following the August 31, 2025, earthquake in Eastern Afghanistan, this study assessed Facebook's involvement in crisis communication using the Dara-e-Noor area as a case study. A significant 65.9% of the variance in overall crisis communication effectiveness can be explained by the Facebook-based information dissemination model, according to the statistical study ($R^2 = 0.659$, $p < 0.001$).

However, the results show that two particular mechanisms—communicative coordination and

emergency needs reporting are the main drivers of this effectiveness. The best predictor was Emergency Needs Reporting ($B = 0.425$, $p < 0.001$), indicating that Facebook's most important function was to provide a real-time platform for assessing disaster damages and organizing humanitarian help. Similarly, by encouraging collaboration between neighborhood organizations and volunteers, Communicative Coordination made a significant contribution to the response ($B = 0.257$, $p = 0.003$).

Notably, when examined in conjunction with other variables, Information Production and Quality ($p = 0.089$) and Information Dissemination and Awareness ($p = 0.154$) did not achieve individual statistical significance inside the regression model, despite having high descriptive mean scores. This implies that the platform's usefulness in the particular context of Dara-e-Noor is primarily found in its reporting and functional coordination capacities than in its function as a primary source of high-quality news or general awareness.

Theoretically, these results validate Media Dependency Theory, confirming that in remote areas where formal systems are absent or disrupted, digital platforms become indispensable for collective action. Practically, the study concludes that national disaster management authorities (ANDMA) should integrate social media not just as a broadcast tool, but as a strategic coordination and needs-assessment framework to enhance the resilience of isolated communities during future crises.

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